

WHAT IS CLAIMED IS:

1. In a harvester for vine crops, such as tomatoes, wherein the vines are severed near ground level and removed from the ground with severing means, where the harvester has a wheel-mounted frame having a forward end, a rear end, a right side, a left side and a center, means for moving said harvester forwardly in a field, pickup means adjacent said forward end for picking up crops and attached vines from the field and carrying the crops and vines rearwardly and upwardly, and separating means for separating crops from the vines, an improvement in the pickup means comprising:
 - a plurality of ground-engaging conveyors comprising a central conveyor and an outrigger conveyor, the central conveyor and outrigger conveyor extending from the forward end of the harvester, each conveyor having a bottom end and a top end, a cutter attached at the bottom end, the outrigger conveyor pivotally attached to the central conveyor such that the outrigger conveyor may be pivoted from a first position with the outrigger conveyor in the same relative position as the central conveyor, to a second position with the outrigger conveyor at approximately a right angle to the central conveyor.
2. The pickup means of claim 1 wherein the central conveyor and outrigger conveyor each comprise a drive shaft at the top end and a plurality of rods connected by a belt at each end of the rods,
- 20 3. The pickup means of claim 2 further comprising a hydraulic motor coupled to the drive shaft.
4. The pickup means of claim 1 further comprising a lower cross-conveyor transversely mounted at the top end of the outrigger conveyor, the lower cross-conveyor adapted to receive crops and attached vines transported upwardly from the outrigger conveyor, the lower cross-conveyor moving said crops and attached vines from a side of the frame toward the center of the frame.
- 25 5. The pickup means of claim 4 further comprising an intermediate endless loop conveyor such that the long axis of the intermediate conveyor is approximately parallel to the center of the harvester, the intermediate conveyor receiving crops and attached vines from the cross-

conveyor and transporting the crops and attached vines upwardly to the separating means.

6. In a harvester for vine crops, such as tomatoes, wherein the vines are severed near ground level and removed from the ground with severing means, where the harvester has a wheel-mounted frame having a forward end, a rear end, a right side, a left side and a center, means for moving said harvester forwardly in a field, pickup means adjacent said forward end for picking up crops and attached vines from the field and carrying the crops and vines rearwardly and upwardly, and separating means for separating crops from the vines, an improvement in the pickup means comprising:

10 a plurality of ground-engaging conveyors comprising a central conveyor, a right-side outrigger conveyor, and a left-side outrigger conveyor, the central conveyor, right-side outrigger conveyor and left-side outrigger conveyor extending from the forward end of the harvester, each conveyor having a bottom end and a top end, a cutter attached at the bottom end, the right-side outrigger conveyor pivotally attached to the central conveyor such that the right-side outrigger conveyor may be pivoted from a first position with the right-side outrigger conveyor in the same relative position as the central conveyor, to a second position with the right-side outrigger conveyor at approximately a right angle to the central conveyor, and the left-side outrigger conveyor pivotally attached to the central conveyor such that the left-side outrigger conveyor may be pivoted from a first position with the left-side outrigger conveyor in the same relative position as the central conveyor, to a second position with the left-side outrigger conveyor at approximately a right angle to the central conveyor

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7. The pickup means of claim 6 wherein the central conveyor, the right-side outrigger conveyor and the left-side outrigger conveyor each comprise a drive shaft at the top end and a plurality of rods connected by a belt at each end of the rods,

8. The pickup means of claim 7 further comprising a hydraulic motor coupled to the drive shaft.

9. The pickup means of claim 6 further comprising a lower left cross-conveyor transversely mounted at the top end of the left-side outrigger conveyor, the lower left cross-conveyor adapted to receive crops and attached vines transported upwardly from the left-side outrigger

conveyor, the lower left cross-conveyor moving said crops and attached vines from the left side of the frame toward the center of the frame.

10. The pickup means of claim 6 further comprising a lower right cross-conveyor transversely mounted at the top end of the right-side outrigger conveyor, the lower right cross-conveyor adapted to receive crops and attached vines transported upwardly from the right-side outrigger conveyor, the lower right cross-conveyor moving said crops and attached vines from the right side of the frame toward the center of the frame.
11. The pickup means of claim 9 further comprising an intermediate endless loop conveyor such that the long axis of the intermediate conveyor is approximately parallel to the center of the harvester, the intermediate conveyor receiving crops and attached vines from the lower left cross-conveyor and transporting the crops and attached vines upwardly to the separating means.
12. The pickup means of claim 10 further comprising an intermediate endless loop conveyor such that the long axis of the intermediate conveyor is approximately parallel to the center of the harvester, the intermediate conveyor receiving crops and attached vines from the lower right cross-conveyor and transporting the crops and attached vines upwardly to the separating means.
13. In a harvester for vine crops, such as tomatoes, wherein the vines are severed near ground level and removed from the ground with severing means, where the harvester has a wheel-mounted frame having a forward end, a rear end, a right side, a left side and a center, means for moving said harvester forwardly in a field, pickup means adjacent said forward end for picking up crops and attached vines from the field and carrying the crops and vines rearwardly and upwardly, and separating means for separating crops from the vines, an improved separating means comprising:
 - 25 (a) a drum housing;
 - (b) a drum assembly disposed within the drum housing, the drum assembly comprising: (i) a drum having a first end and a second end, the first and second end defining a longitudinal axis oriented transverse to the travel direction of the

5 harvester, and a multiplicity of tines extending radially from the outer peripheral surface of the drum; (ii) a first shaft extending through the drum; (iii) a first weight housing adjacent and coupled to the first end, the first shaft extending through the first weight housing; (iv) a second weight housing adjacent and coupled to the second end; (v) a first hydraulic motor coupled to the first shaft; and (vi) a second hydraulic motor for rotating the drum connected to the second weight housing with a spring coupling, the spring coupling comprising a plurality of springs disposed between two plates; and

10 (c) a plurality of stationary rods mounted adjacent to the tines of the drum such that the tines pass through the stationary rods as the drum rotates.

15 14. The improved separating means of claim 13, wherein the first weight housing and the second weight housing each comprise: (i) a plurality of weight shafts secured within each weight housing; (ii) a plurality of eccentrically mounted weights mounted on the weight shafts; (iii) transmission means connecting the first shaft to the weight shafts in the weight housings for rotating the eccentrically mounted weights mounted therein.

16. The improved separating means of claim 14 wherein the transmission means comprise a first sheave mounted on the first shaft coupled to the weight shafts of the first weight housing with belts and a second sheave mounted on the first shaft coupled to the weight shafts of the second weight housing with belts.

20 17. The improved separating means of claim 14, wherein the total weight of the eccentrically mounted weights is in excess of 450 pounds.

18. The improved separating means of claim 13, wherein the angular velocity of the drum does not exceed 200 revolutions per minute.

25 19. In a harvester for vine crops, such as tomatoes, wherein the vines are severed near ground level and removed from the ground with severing means, where the harvester has a wheel-mounted frame having a forward end, a rear end, a right side, a left side and a center, means for moving said harvester forwardly in a field, and pickup means adjacent said forward end for picking up crops and attached vines from the field and carrying the crops and vines rearwardly and

upwardly, and separating means for separating crops from the vines, improvements to the harvester comprising:

- (a) the pickup means comprising: a plurality of ground-engaging conveyors comprising a central conveyor and an outrigger conveyor, the central conveyor and outrigger conveyor extending from the forward end of the harvester, each conveyor having a bottom end and a top end, a cutter attached at the bottom end;
- (b) the separating means comprising:
 - (i) a drum housing;
 - (ii) a drum assembly disposed within the drum housing, the drum assembly comprising: (1) a drum having a first end and a second end, the first and second end defining a longitudinal axis oriented transverse to the travel direction of the harvester, and a multiplicity of tines extending radially from the outer peripheral surface of the drum; (2) a first shaft extending through the drum; (3) a first weight housing adjacent and coupled to the first end, the first shaft extending through the first weight housing; (4) a second weight housing adjacent and coupled to the second end; (5) a first hydraulic motor coupled to the first shaft; and (6) a second hydraulic motor for rotating the drum connected to the second weight housing with a spring coupling, the spring coupling comprising a plurality of springs disposed between two plates; and
 - (iii) a plurality of stationary rods mounted adjacent to the tines of the drum such that the tines pass through the stationary rods as the drum rotates.

- 19. The harvester of claim 18 wherein the first weight housing and the second weight housing each comprise: (i) a plurality of weight shafts secured within each weight housing; (ii) a plurality of eccentrically mounted weights mounted on the weight shafts; (iii) transmission means connecting the first shaft to the weight shafts in the weight housings for rotating the eccentrically mounted weights mounted therein.
- 20. The harvester of claim 19 wherein the transmission means comprise a first sheave mounted on the first shaft coupled to the weight shafts of the first weight housing with belts and a second

sheave mounted on the first shaft coupled to the weight shafts of the second weight housing with belts.

21. The harvester of claim 19, wherein the total weight of the eccentrically mounted weights is in excess of 450 pounds.

5 22. The harvester of claim 19, wherein the angular velocity of the drum does not exceed 200 revolutions per minute.

23. In a harvester for vine crops, such as tomatoes, wherein the vines are severed near ground level and removed from the ground with severing means, where the harvester has a wheel-mounted frame having a forward end, a rear end, a right side, a left side and a center, means for moving said harvester forwardly in a field, and pickup means adjacent said forward end for picking up crops and attached vines from the field and carrying the crops and vines rearwardly and upwardly, and separating means for separating crops from the vines, improvements to the harvester comprising:

(a) the pickup means comprising: a plurality of ground-engaging conveyors comprising a central conveyor and an outrigger conveyor, the central conveyor and outrigger conveyor extending from the forward end of the harvester, each conveyor having a bottom end and a top end, a cutter attached at the bottom end, the outrigger conveyor pivotally attached to the central conveyor such that the outrigger conveyor may be pivoted from a first position with the outrigger conveyor in the same relative position as the central conveyor, to a second position with the outrigger conveyor at approximately a right angle to the central conveyor;

(b) the separating means comprising:

(i) a drum housing;

(ii) a drum assembly disposed within the drum housing, the drum assembly

25 comprising: (1) a drum having a first end and a second end, the first and second end defining a longitudinal axis oriented transverse to the travel direction of the harvester, and a multiplicity of tines extending radially from the outer peripheral surface of the drum; (2) a first shaft extending through the drum; (3) a first

5 weight housing adjacent and coupled to the first end, the first shaft extending through the first weight housing; (4) a second weight housing adjacent and coupled to the second end; (5) a first hydraulic motor coupled to the first shaft; and (6) a second hydraulic motor for rotating the drum connected to the second weight housing with a spring coupling, the spring coupling comprising a plurality of springs disposed between two plates; and

10 (iii) a plurality of stationary rods mounted adjacent to the tines of the drum such that the tines pass through the stationary rods as the drum rotates.

15 24. The harvester of claim 23 wherein the wherein the first weight housing and the second weight housing each comprise: (i) a plurality of weight shafts secured within each weight housing; (ii) a plurality of eccentrically mounted weights mounted on the weight shafts; (iii) transmission means connecting the first shaft to the weight shafts in the weight housings for rotating the eccentrically mounted weights mounted therein.

20 25. The harvester of claim 24 wherein the transmission means comprise a first sheave mounted on the first shaft coupled to the weight shafts of the first weight housing with belts and a second sheave mounted on the first shaft coupled to the weight shafts of the second weight housing with belts.

25 26. The harvester of claim 24, wherein the total weight of the eccentrically mounted weights is in excess of 450 pounds.

30 27. The harvester of claim 24, wherein the angular velocity of the drum does not exceed 200 revolutions per minute.